IN THE CLAIMS:

Please amend the claims as follows:

1. (Original) A method for compensating for polarization mode dispersion in an optical fiber communication system, comprising the steps of:

reducing said polarization mode dispersion using a cascade of all-pass filters; and

adjusting coefficients of said all-pass filters using a least mean square algorithm

2. (Original) The method of claim 1, wherein said cascade of all-pass filters comprises a two-channel structure consisting of multiple cascades of all-pass filters and directional couplers.

3. (Original) The method of claim 1, wherein said coefficient values are adjusted to minimize a cost function.

4. (Original) The method of claim 1, further comprising the step of measuring said polarization mode dispersion in a received optical signal

5. (Original) The method of claim 4, wherein said measuring step employs a tunable narrowband optical filter to render information from energy detector measurements

6. (Currently Amended) The method of claim 1, wherein said cascade of all-pass filters comprises a first all-pass filter A having a vector a comprised of P coefficients and a second all-pass filter B having a vector b comprised of Q coefficients and wherein said least mean square algorithm adjusts said coefficients as follows:

$$\mathrm{w}(n+1) = \mathrm{w}(n) - \mu\nabla(J),$$

where n indicates the current iteration number and w is a composite coefficient vector defined as:

$$\mathrm{w} = \begin{bmatrix} \mathrm{a} \\ \mathrm{b} \end{bmatrix}, \ \nabla(J) \equiv \begin{bmatrix} \dfrac{\partial J}{\partial \mathrm{a}^T} \dfrac{\partial J}{\partial \mathrm{b}^T} \end{bmatrix}^T$$

is the $(P+Q)\times 1$ complex gradient of J with respect to w and T indicates a transpose operation, and

$$\frac{\partial J}{\partial \mathrm{a}^T} \equiv \begin{bmatrix} \dfrac{\partial J}{\partial a_1} & \dfrac{\partial J}{\partial a_2} & & \dfrac{\partial J}{\partial a_P} \end{bmatrix}, \text{ and}$$

$$\frac{\partial J}{\partial \mathrm{b}^T} \equiv \begin{bmatrix} \frac{\partial J}{\partial b_1} & \frac{\partial J}{\partial b_2} & \cdots & \frac{\partial J}{\partial b_Q} \end{bmatrix}.$$

7. (Original) A method for compensating for polarization mode dispersion in an optical fiber communication system, comprising the steps of:

reducing said polarization mode dispersion using a cascade of all-pass filters; and adjusting coefficients of said all-pass filters using a Newton algorithm.

8. (Original) The method of claim 7, wherein said cascade of all-pass filters comprises a two-channel structure consisting of multiple cascades of all-pass filters and directional couplers

9. (Original) The method of claim 7, wherein said coefficient values are adjusted to minimize a cost function.

10. (Original) The method of claim 7, further comprising the step of measuring said polarization mode dispersion in a received optical signal.

11. (Original) The method of claim 10, wherein said measuring step employs a tunable narrowband optical filter to render information from energy detector measurements

12. (Currently Amended)The method of claim 7, wherein said <u>cascade of all-pass filters comprises a first all-pass filter A having a vector a comprised of P coefficients and a second all-pass filter B having a vector b comprised of Q coefficients and wherein said</u> Newton algorithm adjusts said coefficients as follows:

$$\mathrm{w}(n+1) = \mathrm{w}(n) - \mu \mathrm{H}^{-1} \nabla(J)$$

where <u>n indicates the current iteration number and</u> w is a composite coefficient vector defined as:

$$\mathrm{w} = \begin{bmatrix} \mathrm{a} \\ \mathrm{b} \end{bmatrix}, \ \nabla(J) \equiv \begin{bmatrix} \frac{\partial J}{\partial \mathrm{a}^T} \frac{\partial J}{\partial \mathrm{b}^T} \end{bmatrix}^T$$

$\frac{\partial J}{\partial \mathrm{a}^T} \equiv \begin{bmatrix} \frac{\partial J}{\partial a_1} & \frac{\partial J}{\partial a_2} & & \frac{\partial J}{\partial a_P} \end{bmatrix}$, is the $(P+Q)\times 1$ complex gradient of J with respect to w<u>, T indicates a transpose operation and</u>, a Hessian matrix, H, is defined as follows:

$$\mathrm{H} = \frac{\partial^2 J}{\partial \mathrm{w} \partial \mathrm{w}^T} = \begin{bmatrix} \frac{\partial^2 J}{\partial \mathrm{a} \partial \mathrm{a}^T} & \frac{\partial^2 J}{\partial \mathrm{a} \partial \mathrm{b}^T} \\ \frac{\partial^2 J}{\partial \mathrm{b} \partial \mathrm{a}^T} & \frac{\partial^2 J}{\partial \mathrm{b} \partial \mathrm{b}^T} \end{bmatrix} \text{and}$$

$$\frac{\partial J}{\partial \mathrm{b}^T} = \begin{bmatrix} \frac{\partial J}{\partial b_1} & \frac{\partial J}{\partial b_2} & \cdots & \frac{\partial J}{\partial b_Q} \end{bmatrix}$$

13. (Original) A polarization mode dispersion compensator in an optical fiber communication system, comprising:

a cascade of all-pass filters having coefficients that are adjusted using a least mean square algorithm.

14. (Original) The polarization mode dispersion compensator of claim 13, wherein said cascade of all-pass filters comprises a two-channel structure consisting of multiple cascades of all-pass filters and directional couplers.

15. (Original) The polarization mode dispersion compensator of claim 13, wherein said coefficient values are adjusted to minimize a cost function.

16 (Original) The polarization mode dispersion compensator of claim 13, further comprising the step of measuring said polarization mode dispersion in a received optical signal

17 (Original) The polarization mode dispersion compensator of claim 16, wherein said measuring step employs a tunable narrowband optical filter to render information from energy detector measurements

18. (Original) A polarization mode dispersion compensator in an optical fiber communication system, comprising:

a cascade of all-pass filters having coefficients that are adjusted using a Newton algorithm

19 (Original) The polarization mode dispersion compensator of claim 18, wherein said cascade of all-pass filters comprises a two-channel structure consisting of multiple cascades of all-pass filters and directional couplers

20. (Original) The polarization mode dispersion compensator of claim 18, wherein said coefficient values are adjusted to minimize a cost function

21 (Original) The polarization mode dispersion compensator of claim 18, further comprising the step of measuring said polarization mode dispersion in a received optical signal

22. (Original) The polarization mode dispersion compensator of claim 21, wherein said measuring step employs a tunable narrowband optical filter to render information from energy detector measurements.